TEXT:
    Science and Technology Approval Plans Compared
    This study compared the performance of two general approval plan
    vendors with that of two sci/tech specialty vendors in identifying
sci/tech
    titles that matched a library profile. No significant difference
existed in the
    number of titles supplied. Coverage within given disciplines
reflected
    overall coverage. Commercial publishers were better represented than
    university presses and societies. Difficulties in using an approval
plan to
    cover sci/tech subject areas persist.
    Studies have shown that the primary method of scholarly discourse in
science and technology (sci/tech) is through journals rather than books.[1]
Nevertheless, academic libraries must buy some books to support the
curriculum, particularly in programs with many undergraduates. Some
libraries may not have a large number of sci/tech bibliographers and rely
on approval plans for book selection to some extent. The question of
adequate quantity and quality of coverage then arises. This study compares
the performance of two major approval plan vendors, designated Major Vendor
1(MV1) and Major Vendor 2(MV2), with the performance of two sci/tech
specialty vendors, called Specialty Vendor 1(SV1) and Specialty Vendor
2(SV2), in supplying sci/tech books as specified by a broad-based subject
profile.
    LITERATURE REVIEW
    In an article addressing the ideal characteristics of a
bibliographer, Ryland makes the offhand remark that the sciences should be
excluded from approval plans for obvious reasons.[2] Ryland fails to state
reasons, however.
    The literature on approval plans is extensive, but relatively few
articles address the performance of approval plans for sci/tech
collections. The focus has been on the overall advantages and disadvantages
of approval plans as a selection method. Based on an analysis of
circulation records. Evans and Argyres conclude that approval plans are
least satisfactory for the sciences. Their analysis reveals a significantly
greater use of science books selected by librarians than of those received
on approval.[3]
    In a paper written in the mid-1970s, DeVilbiss compared approval plan
receipts with firm order receipts for the biological sciences and concludes
that "the biological sciences approval program failed to bring in titles
which could reasonably have been expected as approval receipts, but caused
the acquisition of titles which were never requested by faculty or
librarians."[4] This conclusion supports the work of Evans and Argyres.
    One exception to the generally negative opinion of approval plans for
sci/tech is supplied in an earlier study undertaken at Texas A&M
University. Hodge says that "the approval plans appear to be supplying
automatically a large portion of the more academically-oriented, higher
quality books of the major sci-tech publishers in a timely manner."[5]

However, even this study cautions that certain subject areas (manufacturing, agriculture, and geosciences) should be carefully monitored.

Many studies compare the performance of firm-order vendors in supplying the same or similar titles,[6] but very few reports attempt to compare the performance of approval vendors. Librarians are cautioned not to choose an approval vendor on an impressionistic basis and are provided with extensive documentation on what to look for in an approval vendor. Nevertheless, it seemed almost impossible to compare approval vendors on a real-time basis. Two studies that attempt real-time comparisons are Gregor and Fraser,[7] and Grant and Perelmuter.[8] Gregor and Fraser compare three vendors supplying three different subjects, but during the same time-frame. Grant and Perelmuter compared vendor performance in supplying the same books (university press) over a four-month period. Where Grant and Perelmuter look at speed, bibliographic accuracy, and discounts, we emphasize depth of subject coverage among vendors.

Schmidt argues that publisher-based approval plans are more suitable than subject-based plans for domestic publications. She notes that "subject-based plans have inherently a measure of subjectivity in matching subject concepts to individual titles."[9] One of our objectives was to see if, when we asked for the same subject coverage from four different vendors, we got more or less the same titles.

THE PROFILES

The objectives of the study were: (1) to determine the overall quantity of titles supplied in sci/tech by two major vendors and by two sci/tech specialty vendors; (2) to determine the number of common titles received from the two major vendors and the two specialty vendors; (3) to determine coverage for university press and other non-trade publishers; and (4) to determine if some subject disciplines received better coverage than other subject disciplines.

To answer these questions, the investigators arranged with two major vendors and two specialty sci/tech vendors to receive lists of titles that they would supply under the Sterling C. Evans Library's approval profile covering the period from January through May of 1986. (Exclusions to the profile are described below.)

Profiles were established with both major vendors during the previous three years. One of the major vendors was employed as a supplier during the time of the study. The profile with one of the major vendors was last revised in January 1985; the other, in November 1985. Collecting goals of the library did not change during this period and the profiles were as analogous as possible given the different subject and non-subject descriptors of the two vendors.

Profiles were developed for the purposes of this study with two science and technology specialty vendors. They were based on the two established profiles for the major vendors and featured the same exclusions, e.g., no lower-level textbooks were to be supplied. Unlike the two major vendors, the specialty vendors did not have their own subject thesauri. One specialty vendor (SV2) used the LC Classification Outline as the basis for its subject profile; SV1 relied on the LC Classification but in a rather free-form way. With SV1, the customer simply listed in one column all the LC classification numbers for which books should be sent; in the other column LC number for which forms only should be sent were listed.

Because the Evans Library supports a curriculum offering the doctorate in virtually all the sciences, agriculture, and engineering, relatively few exclusions to the subject profile were listed. The major exclusion was the entire R schedule (medicine) since there is a separate medical library. Although we receive some books on approval that fall into the R classification, it was thought that this area would require too much fine tuning to achieve comparability. Also excluded from the profile were some seventeen publishers, most of them societal. This made conclusions about societal coverage less clear. The library has separate approval plans

with Elsevier and Springer Verlag, so those two major scientific publishers were excluded, too. Since these are two of the most important suppliers of sci/tech titles, the assumption was that all vendors would be able to supply their titles without difficulty.

Subject profiling and publisher exclusions were easy. The difficult part of profiling was setting non-subject parameters such as academic level, popular versus scholarly treatment, and physical format. Non-subject parameters are terms that describe a book in ways other than its subject content. A non-subject parameter may address the intended audience for a book: undergraduate, graduate, or general reader. Or a non-subject parameter may relate to scholarly content: popular versus specialist treatment of a subject. Non-subject parameters may also describe a book both in terms of textual format (encyclopedic work, directory, readings/anthology) and physical format (looseleaf, spiralbound, hardbound, and paperbound). For all vendors, non-subject parameters could be set at books, forms, or neither. In the area of non-subject parameters, vendors tend to show the most divergence. The non-subject area is usually the part of the profile needing the most refinement until it meets the goals of the library.

One of the specialty vendors had a rather extensive list of non-subject parameters while the other's list was more concise. However, even in its abbreviated list, SV1 addressed head-on that most troublesome of categories for the mid-1980s approval plan: the computer book. It listed them, quite simply, as "computer book (model specific)" and "computer book (general)" as categories under popular treatment. SV2 was just as straight-forward in its treatment of oversized, heavily illustrated material, calling them "coffee-table books." One of the major vendors did the best job, in the investigators' opinion, in its breakdown of academic levels, while the other was exhaustive in its subject treatment descriptors (adding subdivisions for medical aspects, legal aspects, etc.).

DATABASE CREATION

With some help from the library's Microcomputer Coordinator, the investigators configured a data input matrix for dBASE III. The matrix (see figure 1) contained date, title, author, edition, four source fields, call number, publisher, and publisher type. All fields could be searched, counted, and indexed. Further description of database construction appears in appendix A.

In SV1's list, no distinction could be seen between titles which would be shipped and those which would only be "Recommended for Purchase" notifications. This gave a disproportionate number of titles identified by SV1. To resolve this quirk, SV1 sent us a list of all titles actually shipped during a four-month period, which overlapped but was not identical with the time period under study. The list reflected titles sent to a library whose profile was judged by the vendor to be analogous to Evans Library. Differences in time period and ratio of automatic to form shipment made it impossible to adjust the database on a title-by-title basis, but the investigators did adjust the percentage figures accordingly. While this gave SV1 a distinct advantage throughout the study because they are credited with meeting criteria for a larger number of titles, the authors believe that the results remain reliable.

RESULTS

The number of titles for each of the vendors was counted. SV1's total of 1,141 (60.3% of all titles supplied) was lowered to 889 (see figure 2) to reflect an adjustment for form versus automatic shipment figures. SV2 supplied 717 titles (37.9%). While MV2 supplied 848 (44.8%), MV1, the current contractor, supplied 611 (32.3%). MV1's total was adjusted upward to account for 121 returns, since the study did not include returns for other vendors. The difference in absolute numbers between the highest and lowest number of titles supplied was 157 titles.

Only 77 titles (4%) would have been supplied by all four vendors within the set time period. Interestingly, Grant and Perelmuter obtained a

higher percentage of overlapping titles (10%) when they asked three vendors
to send slips for all university press titles available during a four-month
period, indicating that a broad-based subject profile, even when modified
by non-subject parameters, may suggest to vendors that they can send more
of whatever is available.

In figure 3, the concentric circles around the central 77 titles
consist of 318 titles (17%) supplied by three vendors; 562 titles (30%)
supplied by two; and 935 titles (49%) supplied by only one vendor.[10] Each
of these single vendor titles was especially scrutinized for possible
deletion, but all appeared to be within the guidelines of the study.

A count by call number was performed to determine if there were
differences in the ways the four vendors covered the subject disciplines
addressed by the profile. We found that subject coverage generally followed
the same pattern as overall coverage. SV1, whose titles accounted for 60.3%
of the total database, supplied 59% of the titles in the pure sciences
(Q-QR) and 66% of the titles in technology (T-TX) (see figure 4). We had
conjectured that SV1's overall total might include an inordinate number of
computer books, but this did not prove to be the case. Of a total of 341
titles supplied with call number QA76, SV1 supplied 56%, slightly less than
their overall total. However, only SV2 supplied significantly fewer
computer books (28%) than they did other types.

A surprise in the call number count was the small number of
agriculture titles in the database. Of a total of 1,892 titles only 112
(6%) fell into the call number range S-SK. Probably owing to the low
overall total for agriculture, vendor totals were quite different. Instead
of supplying 60% of the total, SV1 supplied only 43% of the agriculture
titles. MV2, with 53%, supplied the largest number of agriculture titles.
SV2 tied with SV1 in supplying 43%, while MV1's portion of the whole was
only 32%. With the total publishing output so low in agriculture, it
becomes even more important that any one vendor should supply most of those
titles published. That the highest number supplied was only 59 out of 112
is disheartening (see figure 5).

The diversity of titles that would have been supplied by different
vendors using the same profile makes the selection of a vendor (and careful
construction of a profile) even more serious. The idea that a library might
receive essentially the same materials from either of two major vendors or
from either of two specialty vendors is questionable. Coverage seems to
differ with vendor.

Types of publications supplied by different vendors were also
assessed. Of all the titles supplied, 88.5% or 1,677 titles came from
commercial presses while only 10.4% or 196 titles came from university
presses (see figure 6). Society publications accounted for 15 titles,
university associates for two titles, and other categories for three more
titles. MV2 offered the best university press coverage (135), followed by
SV1 (103), with the other two vendors tied at 83 each (see figure 7).

The university press total of 196 titles represents about one-third
of all sci/tech books published by university presses during the year. This
total reflects the generally smaller output of books in sci/tech subjects
by university presses, which are a stronghold of scholarly publishing in
the humanities and, to a lesser extent, the social sciences. Only MV2, with
135 titles, supplied significantly more than half of the total. Remarkably
few societal and association publications appeared in our database,
probably because of our exclusion of so many of these publishers.

The most frequently supplied presses were Prentice-Hall (186 titles),
Wiley (180), and McGraw-Hill (122). Other publishers accounting for large
numbers of titles were D. Reidel (69), Addison Wesley (57), Academic Press
(56), and Cambridge University Press (53) (see figure 7). Several more
publishers were grouped together in the 40s. Breakdowns among the top eight
publishers whose titles accounted for over one-third of the items in the
database appear in figure 8.

The wide variations between overall percentages and percentages for

individual publishers suggest that vendors do not have steady, ongoing relationships with the publishers. The pattern depicted might reflect a practice of vendors contacting publishers on an irregular basis to pick up all titles issued since the last contact. This is not desirable for librarians since it delays the receipt of titles.

CONCLUSIONS

The most obvious conclusion is that the vendor a library uses makes an enormous difference in the market mix of materials received. In general, specialty vendors supplied more titles than general vendors. SV1's adjusted total of 889 and SV2's total of 717 were compared with MV1's adjusted total of 732 and MV2's 848. A comparison between the greatest number supplied by a specialty vendor (889) and the smallest number supplied by a major vendor (732) produced a Z statistic of 4.00, which exceeded the critical value of Z at the .01 level.[11] However, the total for specialty vendors (1,606) and the total for major vendors (1,580) produced a Z statistic of .8603, which was not statistically significant.

Performance in supplying non-commercial titles was disappointing all the way around. MV2 supplied 146 non-commercial titles followed by MV1 with 111, but neither figure is praiseworthy. The two major vendors claim to be able to supply society and association publications and did supply 20 titles; the two specialty vendors say they supply only commercial and university press titles, and yet they supplied three society and association titles.

No patterns seemed to emerge in the types of titles provided by the different suppliers. In an exercise akin to the return privileges of an approval plan, the clearly popular or trivial titles were weeded out during database construction. Popular computer books abounded in the study. All vendors were guilty to some degree. Vendor selection is crucial because each vendor will interpret the subject and non-subject guidelines of a given library in a different manner.

It would be interesting to see this study replicated in the social sciences and the humanities. The variety of suitable titles, three times the number purchased, may not be similar in the social sciences or humanities. Our total database of 1,892 titles approximated the number published.

For the library without sci/tech bibliographers and a continuing need to collect in science and technology to support research and instruction, the problems of choosing a vendor remain. The study suggests that roughly the same numbers and types of titles are available from two major vendors and two specialty vendors. The surprise is that the titles themselves are generally not the same. This conclusion underlines the necessity for rigorous standards for vendor selection, for very exacting profile construction, and for careful monitoring of a sci/tech approval plan once it is established. It also affirms the idea that publisher-based approval plans might work better for the sciences. Ryland's caution about buying science and technology books through an approval plan, while not obvious, seems well founded. [Figures 1 to 8 Omitted]

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[9]Karen A. Schmidt, "Capturing the Mainstream: Publisher-Based and
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Libraries 47:366 (July 1986). [10]Because the Boolean operations available
on dBASE III Assist contain only "and" and "or," the number of titles in
each set had to be established by figuring the whole and then subtracting
the next smaller set. Thus, the core 77 had to be subtracted from each of
the sets. Similarly, the relevant set totals had to be subtracted from the
dyads but the core 77 had to be added back in because otherwise it would
have been subtracted twice, once within each set. [11]The Z Statistic is
used here to compare two proportions for large samples. The null hypothesis
is that the two proportions are identical, i.e., that $[P.sub.1] =
[P.sub.2]$.

APPENDIX A. CONSTRUCTION OF THE DBASE FILE

Database construction began with a list from Specialty Vendor 1, the
largest supplier of titles. The investigators assumed that this would
become a master list, containing perhaps 75 percent of the total titles, to
which other vendor codes could be added by appending codes of two or three
other **vendors** . After a second **list** was **added** , only 208 of these
titles matched the 1,100 already in the database. Our preconceptions had
been wrong.

A comparable list arrived from Major Vendor 2 and was entered as
Source 3 into the database. The list from Specialty Vendor 2 finally
arrived to become Source 4. The database was loaded onto a Bernoulli
cartridge, which gave us space for multiple indexes. The plague of small
problems with diskettes, dBASE III discontinuities, and personal computers
vanished.

Next, we began to address problems of validity and reliability of
data: duplicates, out of range dates, out of range publishers, and types of
materials. Although we had initially requested coverage for the profile
from January 1986 through May 1986, one vendor had also supplied materials
beyond those date ranges. Those titles and a few 1985 titles were removed.
We indexed the file by title and examined it title by title for duplicates.
The source codes were consolidated on the best record and alternative
records were eliminated. The database shrank from 2,486 records to 2,147
records. Throughout these processes, we were grateful that we had decided
to work with an entire database rather than a statistical sample because
adjustments did not skew the sample.

The investigators then indexed the database by call number to check
the subject parameters of the profile. We checked title by title not only
for the suitable call number but also for the suitable level. Since the
Evans Library had never had an approval plan profile with either of the
specialty vendors, we were essentially engaging in the close monitoring of
an approval plan that occurs during the first few months with a **new
vendor** . Although our instructions excluded lower-level textbooks,
specialty Vendor One seemingly had ignored this instruction. Therefore,
titles containing phrases like "Introduction to," "Elementary,"
"Beginning," "Principles of," "How to," and others were examined for
possible deletion. We performed this entire shakedown twice to assure that

the database had a high level of integrity. Two hundred and forty-seven records were judged to be beyond the scope of the profile. Since that total represented only about 10 percent of the entire database, the action seemed within the return parameters of a normal profile.

The investigators then created a publisher index to check for further adjustments. Although all participants had been instructed to omit Elsevier and Springer Verlag, some titles had persisted but were now deleted. Extensive authority work in the publisher index was necessary. The investigators selected the prevalent form of name for each publisher and brought all alternatives into agreement (John Wiley, Wiley and Sons, J. Wiley, Wiley Interscience--all became Wiley).

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CAPTIONS: Data input matrix for dBASE III. (table); Common titles by number of vendors supplying. (graph); Subject coverage by vendor. (table); Percentage of record by subject. (graph); Records by publisher type. (graph); Analyzed records by vendor within publisher type. (graph); Ten most frequently supplied publishers. (graph); Percentage supplied by vendor within publisher. (table)